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PREDICTION OF PHASE SEPARATION DURING THE DRYING OF POLYMER SHELLS *

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During the drying of thin (few μm) polymer layers, vacuole formation is believed to occur as a result of phase separation. To better understand and control this process, we are using a multicomponent diffusion formalism to predict compositional changes in the layer as organic solvents diffuse out and water diffuses into the layer. Formation of thermodynamically unstable compositions leads to phase separation. We are using statistical mechanics, the UNIFAP methodology, and empirical data to deduce the required values of transport coefficients and equilibrium phase compositions. Results for several different polymer-solvent combinations will be presented.

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